



UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 4 Examination in Engineering: December 2018

Module Number: EE4106

Module Name: Software Engineering Principles

[TWO Hours]

[Answer all questions, each question carries 10 marks]

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- Q1 a) Write short notes on following topics.
- i) Abstraction
 - ii) Inheritance
 - iii) Polymorphism
 - iv) Encapsulation
- [4 Marks]
- b) A vehicle is having attributes like make, model, color, number of seats and license plate number.
Program the vehicle class using php or C# that contains the following.
- i) Attributes to store make, model, color, number of seats and license plate number with appropriate visibility.
 - ii) Setter and getter methods for manipulating the attributes in Q1(b)(i).
 - iii) Write a new method for the vehicle class named `getVehicleType`, that will return the vehicle type as "Car" if the number of seats are 5, "Van" if the number of seats are more than 5 and less than 15 and "Bus" if the number of seats are more than 15.
- [6 Marks]
- Q2 a) Write two advantages of drawing a class diagram.
- [2 Marks]
- b) Draw a class diagram using UML for a "School Management System". The system can manage student details, like grades and attendance records. Clearly state the attributes and methods in each of the class.
Note: Use minimum of four classes. You may use object oriented concepts like Inheritance, Abstract class and Encapsulation.
- [4 Marks]
- c) Draw a class diagram to model a "Mobile Phone". Use Aggregation or Composition if required. Include the functions it can do and its components.
- [4 Marks]
- Q3 a) Describe the importance of "Requirement gathering and analysis" phase in Waterfall model.
- [2 Marks]
- b) List four disadvantages of the Waterfall model.
- [2 Marks]

- c) Describe the outcomes of the “Inception Phase” of the Rational Unified Process (RUP) software development process. [2 Marks]
- d) What are the differences between Rational Unified Process (RUP) and Waterfall model? [2 Marks]
- e) List four advantages of Agile software development life cycle model. [2 Marks]

Q4 Assume you are asked to develop a software for the University Library.

- a) Write a list of requirements for the Library Management System of your University.

Note: Write at least six requirements.

[3 Marks]

- b) Draw a use case diagram according to your list of requirements.

[3 Marks]

- c) Draw appropriate classes with associations for the above mentioned Library Management system.

[4 Marks]

Q5 a) Draw the Entity Relationship(ER) diagram related to the software in Q4.

[4 Marks]

- b) Assume that you are given the following part of an ER diagram (Figure Q5) of a Doctor Channeling System.

Draw the table structure you get when the tables are created in a database management system.

Note: Mark primary key and foreign key fields if available.

[6 Marks]

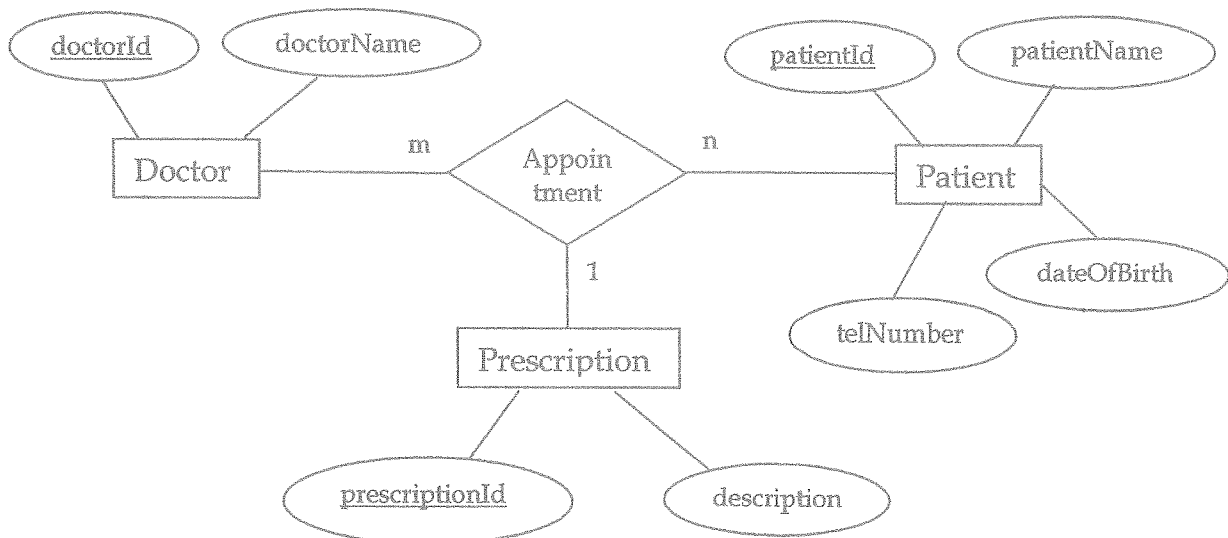


Figure Q5: ER diagram of a Doctor Channeling System