(25 Marks)

Question 1.

Question 1a. (5 marks)
In the Swift programming language, explain the concept of an optional variable. In particular, describe its purpose and how it is declared. Also explain the concept of forced unwrapping. Illustrate your answer with code where appropriate.

Question 1b. (10 marks)
Briefly describe the overall structure of a Django Application including the project/app structure. What is th role of the URLs, Views and Model components in the framework?

Question 1c. (10 marks)
Write a Swift class that represents a class called StudentRecord that represents a simplified student record. The class should have three member variables, name - a string, student identity - a string and a score - a double. Provide a constructor for the class. Also provide a method for the class that updates the score. This method should take a single parameter called score, a double that represents the new score. Provide a samp of code to demonstrate how you would instantiate an instance of this class and also demonstrate how you would call the method to change the score.

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Question 2.

Question 2a. (5 marks)
Give three advantages of an ad-hoc deployment when testing? What are the limitations of an ad- hoc deployment?

Question 2b. (10 marks)
Describe the steps that must be taken to POST information to a server.

Question 2c. (10 marks)
Describe the steps required to pass a string between two views using a segue. Where appropriate, illustrate your answer using code.

Question 3. (30 Ma

Question 3a. (5 marks)
What is an ad-hoc deployment? What constraints apply to an ad-hoc deployment? Describe the steps taken to create an ad-hoc provisioning profile.

Question 3b. (10 marks)
Describe the steps that you must take to add a pan gesture to a UIImageView component.

Question 3c. (15 marks)
Describe - in detail - the general architecture of a service that is capable of sending notifications to a mobile application using Apple Push Notification service (APNs).