**Part A**

**Instructions:  
1. If asked to create an iPhone app, create a separate project for that particular question.**

**2. You are not allowed to access the Internet at all. You may only use Apple documentation.**

**3. Good Luck!**

**Total marks: 150**

Q1. List some other technologies/frameworks other than Xcode, ObjectiveC and Swift that can be used to build iOS apps. [Basics][5]

* What I believe, is that professional developers use Xcode the most to build iOS apps. Swift is newer than Objective C but both can be used to build it.

Q2. In a playground file, create an array of tuple having two elements of type Int and String. Write a function that will convert the values of these two types into two separate array and return from function. [Basics][5]

Q4. Write view controller Life Cycle methods in no particular order. [5]

* viewDidLoad()
* viewWillAppear()
* viewDidAppear()
* viewWillDisappear()
* viewDidDisappear()

Q5. Explain application different state. [5]

* Not running – not been lunched
* Inactive – running in the foreground, not receiving any event
* Active – running in the foreground, receiving events
* Background – running in the background, executing the code
* Suspended – not executing

Q6. Select the components that are minimally **required** for constructing and configuring a *UITableViewController/TableView,* which can be used to view (but not manipulate) a list of items. [Multiple Choice][5]

* c, d

1. UITableViewSource
2. UITableViewCell
3. UITableViewDelegate
4. UITableViewDataSource
5. UIViewController

Q7. Consider the following definition of the structure *Person*:

struct Person {

var address: String?

let name: String

init (name: String) {

self.name = name

self. address = nil

}

mutating func changeAddress(addr: String) {

self.address = addr

}

}

**Select correct statements for above struct. [Multiple Choice][5]**

* a, b, c, d, e

1. The struct Person can be inherited from to create child structs.
2. The initializer init is required to set the initial values of all properties.
3. The property name cannot be changed after initialization.
4. The mutating keyword of changeAddress is required to modify the instance variable address.
5. The changeAddress function can set the property address to nil.

Q8. What is the value of score1.score after this piece of code executes? [Swift][5]

struct Goals {  
var score: Int = 5  
}  
  
var score1 = Goals ()  
var score2 = score1  
  
score2.score += 1

* score1.score is 5 because it is from struct Goals’ variable score which is set to 5.

Q9. Analyse this code and provide a better solution. [Core iOS][5]

var defaults = UserDefaults.standard  
var name = defaults.string(forKey: "name")!  
  
printString(string: name)  
  
func printString(string: String) {  
print(string)  
}

* First remove ! after the defaults.string(forKey: “name”)
* Move printString(string:name) below func printString
* Put printString inside the if let to check if it is nil or not
* var defaults = UserDefaults.standard

var name = defaults.string(forKey: "name")

func printString(string: String) {  
print(string)  
}

if let defaults = UserDefaults.standard.value(forKey: “name”) as? String {

if !defaults.isEmpty {

printString(string: name!)

}

}

Q10. Explain use of below operators: [Swift][10]

1. ? 🡪 used for optional
2. ?? 🡪 used for nil-coalescing
3. ! 🡪 used to force unwrapping
4. ..< 🡪 used inside the for loop, for example,

for i in 0..<5

which means that it is from 0 to 4

1. … 🡪 used inside the for loop, for example,

for i in 0…5

which means that it is from 0 to 5

Q11. Given a string, write a function to count number of occurrences of each character and print the count. [Algorithm][10]

Q12. Write a Swift function to sort an array of integers using bubble sort. [Data Structure][10]

var arrayOfInteger : [Int] = [3, 5, 9, 2, 1, 6]

arrayOfInteger.sort()

Q13. Write an application, that will one screen and there will a button (width: 100, height: 100) in the center of the screen. When user clicks the button it’s with should increase to 150. [AutoLayout][10]

**Part B**

Q14. Create a simple iPhone app that can access the Photo gallery on the simulator and display the selected image in an image view. The image view should have constraints to make it fit the entire screen and should have its display mode set to aspect fit. [Core iOS][20]

Q15. Create an application that will have three screens, On first screen you will have two button named “Present” and “Push”. When you click "Present" it should present a new VC and when you click "Push", it should navigate to a new screen. Make sure you should be able to come to first screen from pushed and presented view controllers. [UI][20]

Q16. Create an app that will display list of items in groups. The data item that need to be displayed is list of soccer players based on Countries. Tapping on a player should present an alert indicating the name and Country of the player. [Core iOS][20]

Q18. Create an app to pass data between view controllers using protocol and delegate. [iOS][10]