Faculty of Computing and Informatics

Department of Computer Science

QUALIFICATION: Bachelor of Computer Science Honours: Software Development	
QUALIFICATION CODE: 08BCSH	LEVEL: 8
COURSE: Mobile Applications Development	COURSE CODE: MAD811S
DATE: June 2019	SESSION: 1
DURATION: 3 HOURS	MARKS: 100

FIRST OPPORTUNITY EXAMINATION QUESTION PAPER	
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INSTRUCTIONS

1. This is a closed book examination with three sections; A, B and C.
2. Answer ALL questions in a separate writing booklet provided to you.
3. Total marks/scores per section are indicated in [], and () per question.
4. For Section C, answer each new question on a new page.
5. Use of any electronic devices is strictly prohibited.
6. NUST's examination rules and regulations apply.

THIS EXAMINATION PAPER CONSISTS OF 4 PAGES
(Excluding this front page)

SECTION A: **[10 marks]**

Select one correct answer from the given options.

1.   In order to install Android Studio you require the following:
        A.   Android Software Development Kit
        B.   Java Development Kit
        C.   Android Runtime
        D.   Dalvik

2.   Build settings can be added in the following gradle files to provide custom settings:
        A.   build.gradle(Project: Exam)
        B.   build.gradle(Module: app)
        C.   settings.gradle (Project Settings)
        D.   gradle.properties (Project Properties)

3.   In some cases an alternative to saving data on shared preferences will be:
        A.   saved activity state
        B.   preferences
        C.   key-value pairs
        D.   none of the above

4.   Choose a correct statement regarding display quality.
        A.   devices with more and smaller density pixels have the best quality
        B.   devices with more and bigger density pixels have the best quality
        C.   devices with less and bigger density pixels have the best quality
        D.   devices with less and smaller density pixels have the best quality

5.   Which of the following is true about external storage:
        A.   read by any app
        B.   always available
        C.   no permissions required to write to it
        D.   files removed when an app is uninstalled

6.   The following manifest category is mandatory only for an app's main activity:
        A.   default
        B.   name
        C.   theme
        D.   launcher

7.   Which of the following provides the widest coverage in locating a user device:
        A.   base stations
        B.   Wi-Fi
        C.   satellite
        D.   IP address

8. Which of the following is proprietary?
   A. Google Maps
   B. Open Street Map
   C. Leaflet
   D. None of them

9. Which of the following is does not result in software bugs?
   A. errors in design or implementation
   B. device limitations
   C. wrong choice of user configurations
   D. missing requirements on how the app should work

10. Which activity lifecycle callback method is appropriate to commit some changes when a new activity covers the app you are developing when in use?
    A. onCreate()
    B. onPause()
    C. onStop()
    D. onResume()

SECTION B: TRUE/FALSE [10marks]

State whether each of the following statements are True or False:

1. Android project files have to be synchronised each time an Internet connection is established. [True/False]

2. Every code has bugs. [True/False]

3. An intent is used to start another activity. [True/False]

4. A conditional breakpoint pauses a program if the test condition is false. [True/False]

5. Permissions should be checked each time an app is run. [True/False]

6. The getLastLocation() method forces the fused location provider to obtain a new location. [True/False]

7. The Data Layer is used to provide GeoJSON data on a Google map. [True/False]

8. The *res/drawable* folder contains launcher icons. [True/False]

9. Shared preferences are used to read and write primitive key value pairs to and from a file. [True/False]

10. The UI thread is also known as the main thread. [True/False]

SECTION C: [80 marks]

Answer all questions giving as much details as possible.

Question C1

a) What are software bugs? Give examples. (4 marks)

b) In attempt to remove software bugs, explain the differences between the following options when stepping through code: (2 marks each)
   i. Step Over
   ii. Step Into
   iii. Step Out

Question C2

a) With examples where necessary, what are the benefits of using string resources as opposed to hardcoding. (5 marks)

b) Briefly explain the use of the Android manifest file. Give examples as it relates to the following declarations: (5 marks)

```
<application
    android:allowBackup="true"
    android:label="@string/app_name"
    ...>
    <activity android:name=".MainActivity">
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />

            <category android:name="android.intent.category.LAUNCHER" />
        </intent-filter>
    </activity>
</application>
```


Question C3 Explain the differences between the following terms:

a) explicit intent and implicit intent (5 marks)

b) Geocoding and Geocoder (5 marks)

Question C4 Consider the following lines of code:

```
protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
```

Give a contextual meaning of the following:

i. protected (2 marks)
ii. setContentView() (2 marks)
iii. **super** (2 marks)
iv. layout (2 marks)
v. *activity_main* (2 marks)

<u>Question C5</u>   (10 marks)
Android devices come with internal and external storage. Give and detailed comparison of the two clearly stating when it is ideal to use each one of them.

<u>Question C6</u>
i.   Explain the importance of always checking some permissions each time your app is run.
                                                                                               (4 marks)
ii.   How are these permissions requested at runtime?   (6 marks)

<u>Question C7</u>
When working with location-based services, what are some of the techniques that are applied to preserve battery?   (10 marks)

<u>Question C8</u>   (10 marks)
Explain five concerns that are faced when developing mobile applications.

[END]