**GRIFFITH COLLEGE DUBLIN**

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**QUALITY AND QUALIFICATIONS IRELAND**

**EXAMINATION**

**BACHELOR OF SCIENCE (HONS) IN COMPUTING SCIENCE**

**STAGE IV**

**EMERGING TECHNOLOGIES**

**Module Code: BSCH-ET**

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**Date: 25th May 2018 Time: 9.45-12.45**

**THIS PAPER CONSISTS OF SIX QUESTIONS**

**FIVE QUESTIONS TO BE ATTEMPTED**

**ALL QUESTIONS CARRY EQUAL MARKS**

**IN ALL CASES, CANDIDATES SHOULD *READ THE ENTIRE QUESTION,* BEFORE ANSWERING ANY PART**

**QUESTION 1 (Custom Views and Multi Touch)**

1. A developer wishes to create a backdrop for an android application. Defend his decision to draw the backdrop using primitives instead of rendering an image.

**(6 marks)**

1. Swipe is a multi-touch gesture that is commonly used on mobile devices. Give two examples of common uses of swipe on Android devices. Explain how swipe is implemented in custom views.

**(8 marks)**

1. Review the following code snippet which creates a square in the custom view, touching the screen will move the square to the touched location. This code contains two major flaws. Find the flaws and indicate what effect they would have on your code.

// Square is Rect object, blue is a Paint object, x\_coord and y\_coord are floats. This objects have //been instantiated in the onCreate method

protected void onDraw(Canvas canvas) {

super.onDraw(canvas);

canvas.save();

canvas.translate(x\_coord, y\_coord);

canvas.drawRect(square, blue);

}

public boolean onTouchEvent(MotionEvent event) {

if(event.getActionMasked() == MotionEvent.ACTION\_DOWN) {

x\_coord = event.getX();

y\_coord = event.getY();

return true;

}

return super.onTouchEvent(event);

}

**(6 marks)**

**Total (20 marks)**

**QUESTION 2** **(Dalvik and ART)**

1. How and why are processes separated from one another within Dalvik?

**(6 marks)**

1. “*The jar format was deemed an unsuitable choice for Android applications*”. Discuss the reasoning behind this statement, state the format that replaced it and discuss one difference and one similarity between the two formats.

**(6 marks)**

1. “The linux kernel was chosen to be the basis of Android OS”. Defend this decision by briefly explaining two benefits of using the Linux Kernel

**(2 marks)**

1. ART replaced Dalvik in Android 4.4 and introduced several improvements. Discuss the Major change between ART and Dalvik and two benefits associated with this change

**(6 marks)**

**Total (20 marks)**

**QUESTION 3 (Sensors)**

1. “Sensors fall into one of two distinct categories”. Justify this statement and describe two of the sensors in each of the category types.

**(8 marks)**

1. How many main sensor delay types are available for the development of android applications? For each of the sensor delay types describe an appropriate situation for its use.

**(4 marks)**

1. State the general rule relating to registering interest in sensors. Explain if there are any exceptions to this rule.

**(2 marks)**

1. “When developing an application that utilises sensors, the developer must carefully consider their use.” Briefly discuss four considerations an application developer must take into account.

**(6 marks)**

**Total (20 marks)**

**QUESTION 4 (Design Patterns)**

1. One of the Schemes recommended for use when designing Mobile UI’s is the FIT scheme. Explain what FIT is, and justify with the aid of examples the guidelines that FIT proposes.

**(8 marks)**

1. “It is recommended that on mobile touch enabled devices common gestures be used wherever possible instead of on screen controls.” Compare and contrast both approaches and explain whether you agree with this statement or not. Finally, support your argument with a real world example.

**(8 marks)**

1. When using notifications it is recommended to avoid using the highest levels of priority of notification if possible. Explain why this is the case with reference to how such notifications affect the UI and the User experience

**(4 marks)**

**Total (20 marks)**

**QUESTION 5 (Marshmallow Changes)**

1. Illustrate with the aid of diagrams how an android device does its processing with and without Doze mode activated. Using these diagrams explain the goal Doze mode was designed to achieve and how the functionality achieves this goal.

**(12 marks)**

1. Compare and contrast the old permissions system with the new on introduced. Evaluate how this affects user security with respect to permissions.

**(8 marks)**

**Total (20 marks)**

**QUESTION 6** **(Android Programming)**

1. Indicate in which file the following piece of code would appear. Describe the role of the file with particular attention to application permissions.

<**application  
 android:allowBackup="true"  
 android:icon="@mipmap/ic\_launcher"  
 android:label="@string/app\_name"  
 android:roundIcon="@mipmap/ic\_launcher\_round"  
 android:supportsRtl="true"  
 android:theme="@style/AppTheme"**>  
 <**activity android:name=".MainActivity"**>  
 <**intent-filter**>  
 <**action android:name="android.intent.action.MAIN"** />  
  
 <**category android:name="android.intent.category.LAUNCHER"** />  
 </**intent-filter**>  
 </**activity**>  
</**application**>

**(9 marks)**

1. Write code for a listener for a button. When the button is pressed a value in a text field is incremented by one.

How would the listener change if the click was to launch the camera and take a photo?

**(11 marks)**

**Total (20 marks)**