Instructions

This question paper has a total of 10 short questions each of 3 marks, and 1 programming question of 10 marks. The duration of this exam is 1 hour.

Short Questions

1. Consider a case where an app tries to access the data present in the trusted environment. How would it be able to do so?
   Utilize Android API – 2 marks
   Some Android API's specifically provide such limited access – 1 mark

2. Suppose you have an app that has a binary tree data structure. You need to transfer this data structure to a server. How would you do this, and which library can help in Android?
   Need to use Serialization – 2 marks
   Multiple libraries available – 1 mark

3. Consider a video streaming service that uses HTTP. Which transport protocol would be used in this case, and which operation in HTTP is used to get a new chunk of data?
   TCP – 1.5 marks
   GET Operation – 1.5 marks

4. Suppose you have a set of tasks in an app that require you to react to events, such as user taps. From a software engineering perspective, what is the best way to do it in Android?
   Registering for events / use of co-routines – 3 marks

5. "Android apps are significantly slower due to use of just-in-time compilation". Do you agree with this statement, and why or why not?
   This is wrong / no, I do not agree – 1 mark
   Because modern Android uses Ahead of Time compilation / compilation is performed at the time of installation – 2 marks

6. Suppose you have an app that has to show a lot of text on a Textbox. Is this going to be a problem due to the amount of computation needed? What is an approach to reduce this computation?
   Yes, too much of computation – 1 mark
   Using lazy fields – 2 marks

7. Suppose you have a task that is running in the background. Would you prefer to use the small core or the big core for it, and why?
   Small core is better – 1 mark

The task is not urgently needed, so power can be saved using small core – 1 + 1 marks

8. Suppose a hardware vendor introduces a feature which makes some of the Android apps on the Google Playstore non-functional. Is it still possible to sell the hardware, and if so, what would need to change while selling it?
Yes, possible to sell – 1 mark
Cannot be branded as an Android product – 2 marks

9. Consider an application that writes to a database as information in the form of streams comes in. Is it a good idea to write to the database as soon as the information comes in, or is some other strategy better? Justify.
No, writing immediately not a good idea – 1 mark
Better strategy is to store the data in blocks and then write a block together – 2 marks

10. Suppose you have an app that utilizes end-to-end encryption, but does not use TLS. Is such an app possible to develop, and will it be allowed to be hosted on Google PlayStore?
Possible to develop – 1 mark
Cannot be hosted on Google PlayStore – 2 marks

Programming Questions

1. Write a program that accepts a floating point number, and converts it into scientific notation. For example, if you enter 0.0041, it gives 4.1 * 10^(-3). This should contain the required input field, a working button and a single textbox.

- Input field, button and parsing of numbers – 5 marks
- Output textbox that is functional – 5 marks
- Conversion of the string into scientific notation – 5 marks

Assigned TAs

- Programming Question – Atishay
- Q1-2: Abhishek
- Q3-4: Amey
- Q5-6: Aryaman
- Q7-8: Shraman
- Q9: Abhishek
- Q10: Amey