National University of Computer and Emerging Sciences, Lahore Campus

Course:	**Software for Mobile Devices**	**Course Code:**	**CS-440**
Program:	**BS (Computer Science)**	**Semester:**	**Fall 2019**
Duration:	**180 Minutes**	**Total Marks:**	**80**
Paper Date:	**10th-Dec-19**	**Weight**	**40%**
Section:	**A, B & C**	**Page(s):**	**11**
Exam:	**Final**	**Reg. No.**	

Instruction/Notes: *Please solve the exam on the paper. No answer sheets to be attached*
Paper is open book and open notes.
While writing code, make best effort to write correct and relevant code only. Minor syntactic errors are acceptable and will be ignored during marking but overall concept and approach must be correct.

☺ The expert in anything was once a beginner ☺

Question 1 **(20 points)**

Answer the following questions (Attempt any five)

1 – What is ANR message in Android? What are some measures you can use to avoid ANR?

2- How does APK builds from Java file, illustrate all the steps.

3- What is the benefit of uploading App Bundle on PlayStore?

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4 - How can a developer misuse accessibility service to harm users?

5- Can we make different layouts for a same activity for landscape and portrait mode? If Yes How? If No Why?

6- Give an example where you would use weak reference over strong reference, and why?

7- What is the latest version of Android?

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Question 2 **(20 points)**

A- Consider YouTube App. You have subscribed to a particular YouTube channel. Whenever the owner of that YouTube Channel uploads a video, a push notification is sent to all mobile users telling that a video has been uploaded, and whenever user clicks that notification it navigates him to the VideoWatch Screen. Describe the architectural approach required to implement this whole feature (Server + Android), supplemented with relevant code, where necessary. **(10)**

Overall Approach (server + android): **4**

Android Code + Server Modules Used/Logic: **6**

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B- You are required to make a Verification Screen. In which there is 1 EditText and a "send verification code" button. When you tap that button, a message should send from your SIM to your own number (Written in EditText). If that message is equal to “success” then your application navigates to another screen otherwise nothing happens. Write the necessary code to work out this functionality. **(10)**

Overall Approach **(4)**

Android Code of all modules being used: **(6)**

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Question 3 **(40 points)**

You need to make application in MVP or MVVM. Consider designing a simple Quotations application. When user opens the application (s)he will see some quotations from famous authors around the world and will go to next screen on tap of a single button.

The important consideration is that the layout containing View components such as textview, imageview, button will be determined through server, along with their sequence and layout attributes such as margin, padding, text, text size etc (you need to draw only those view components which are coming from server with their respective attributes).
You will get all these elements after API is hit. (If button comes first in layout it should be drawn first, if imageview comes first in layout it should be drawn first and so on) with their respective attributes. All these layouts will be drawn vertically and you need to code in Java to draw these.
Basic flow of application is illustrated as under:
[App launches → Server API Hit automatically → after the response, UI is loaded → users see quotations → tap button → goes to next screen]

You are required to:

- Parse the layout from the server, while dealing with both success and failure scenarios. Work out whole architecture with MVP or MVVM Design pattern with proper thread management for handling the response. **15 points**
- On success response, display the UI programmatically with proper thread management. Use all the attributes in the defined layout and display the components in correct order (as they appear in the layout) **15 points**
- On failure response, show toast message to user **5 points**
- When user clicks on next button, move to next quotation **5 points**

Success JSON Response:


```
{
    "status_code": 200,
    "message": "Ok",
```

```
"data": [{
        "view_component": "textview",
        "view_content": "good luck",
        "view_url": null,
        "view_padding": 20,
        "view_text_size": 17
    },
    {
        "view_component": "imageview",
        "view_content": null,
        "view_url": "https://www.someimageonweb.com/smiley.png",
        "view_padding": 20,
        "view_text_size": 0
    },
    {
        "view_component": "button",
        "view_content": "Next",
        "view_url": null,
        "view_padding": 30,
        "view_text_size": 17
    }
]
```

}

Failure JSON Response


```
{
    "status_code": 700,
    "message": "Some error occurred, please try again later.",
    "data": null
}
```

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