Course:	Software for Mobile Devices	**Course Code:**	CS-440
Program:	BS (Computer Science)	**Semester:**	Fall 2018
Duration:	60 Minutes	**Total Marks:**	30
Paper Date:	15-Nov-18	**Weight**	12.5 %
Section:	A & B	**Page(s):**	4
Exam:	Midterm-II	**Reg. No.**	

Instruction/Notes: Please solve the exam on the paper. No answer sheets to be attached

Students are allowed a double-sided two pages cheat sheet.

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.

Question 1 (15 points)

Consider a Contacts application implementing a **content provider** with the following specification:

Authority	com.mycontacts
Table name	Contacts
Columns	
Column	**Description**
Name	Name of the contact
Email	Email of the contact
Phone	Phone of the contact

The task is to write a **local bound** service that can extract the information of a contact based upon his/her email address and export it into vCard format.

vCard is a simple text based standard used for exchanging contacts information. A sample is shown below

```
BEGIN: VCARD
VERSION: 4.0
N: IJAZ;ALI;
TEL;TYPE=work;VALUE=uri:tel:+92-42-111-111-100
EMAIL: ijaz.ali@somedomain.com
END: VCARD
```

The service may simply return the vCard to the caller. There is no need to write to a file.

The basic skeleton of the service is provided that needs to be filled. There is no need to show its binding to an activity.

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```
class VcardService extends Service {

   public String convert(String email){
      // write contact extraction to vcard code here












   }

   // write rest of the life cycle events, necessary for binding, here














}
```

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Question 2   **(15 points)**

Answer the following questions in the space provided.

1. Suppose your app uses local database (sqlite) for storing various data and Millions of people are already using it. You suddenly realize that you <u>need a new column</u> in a specific table lets say "users" (of sqlite database) which was already shipped in the previous versions to your customers. What will you do to make sure this new table structure replaces the previous structure and also your old data doesn't get removed?

   (a) Mention method name (hint: overriden from SQLiteOpenHelper) in which you will handle logic.

   (b) Mention what change will trigger that particular method to run when they install new version of the app

2. Considering storage in shared preferences:

   (a) In what manner each value is stored?

   (b) Can we use multiple shared preferences (files) in a single application?

   (c) When an application is upgraded, does previous shared preferences data persists or not?

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3. You are tasked to write an application that when-ever phone reboots, your service gets initiated. How would you do that?

(Your pseudo code must be in **those** classes, no need to follow exact syntax. Write class names, whom they extend and their inner functionalities. If there is something to change in manifest then also write that.)