[Time: $2\frac{1}{2}$ Hours]   **[Marks: 75]**

Please check whether you have got the right question paper.

N.B:
1. **All questions are compulsory**.
2. Figures to the right indicate marks.
3. Illustrations, in-depth answers and diagrams will be appreciated.
4. **Mixing** of sub-questions in **not allowed**.

Q.1   Attempt the following (any THREE):   **15**
a) What is Android? List any five Android SDK features.
b) Explain in brief any five Android development tools.
c) What is an activity? Explain life cycle of an activity.
d) Describe Android architecture.
e) What is a fragment? How fragments can be created? Explain any one method with appropriate code to create a fragment.
f) What is an Intent object? What information Intent object consists? Explain different types of intents along with their usage,

Q.2   Attempt the following (any THREE):   **15**
a) What are View and View Group classes in Android? Why layouts are created using xml file?
b) When Relative Layout layout is used? Explain any six attributes of Relative Layout.
c) What is context menu? Develop Android application to demonstrate context menu.
d) List various data storage options. What is SQLite database? Write in brief and explain code to create a database of your choice in SQLite. **(Write code related to create database only)**
e) Develop Android application to store information about your favorite friend in external storage. What permission is required for this application? Where you will write this permission?
f) List different notification techniques used for notifying the user. Explain any one technique using example.

Q.3   Attempt the following (any THREE):   **15**
a) Write Android application to check whether the network is available or not? How you will show MAC address of a device in a Toast message?
b) What is a web service? Why it is required? How a web service can be consumed in an Android application?
c) List and explain any five classes / subclasses of Google Maps Android API.
d) How you can display current location of a user in Android application?
e) Explain with description any five methods of Telephony Manager class.
f) Which classes are provided by Android framework to play audio and video files? What are uses of these classes? How audio file can be played through Media player? Where this audio file need to be kept?

Q.4   **Attempt the following (any THREE):**   **15**
   a) What is a Thread? Which are two ways to create a new thread of execution. What is a worker thread?
   b) How Bluetooth functionality can be made available through program? What permissions are required to access Bluetooth?
   c) What is Wi-Fi? Why Wi-Fi functionality is required in Android application? List any three classes of android.netwifi package with their description.
   d) Explain Property animation method to animate the properties of a View object with example.
   e) What are uses of ShapeDrawable class? Develop Android application to show the oval with red color.
   f) What is use of Google Firebase Cloud Messaging? What are its key capabilities?

Q.1   **Attempt the following (any THREE):**   **15**
   a) What is use of AndroidManifest.xml file in any Android application?
   b) Explain role of R.java file in Android application.
   c) Write Android application to send email.
   d) Explain AsyncTask using suitable example.
   e) Develop Android database application to create a student database.
        Create table TYBSC in a student database. Structure of TYBSC table is as follows:
        Rollno integer
        Sname varchar(20)
        Gender char
        Write code for inserting 3 records in TYBSC and display all 3 records in Toast message.
   f) List two techniques to send SMS on mobile devices. Explain any one in detail.

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