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GRADE
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# Module 1 - Overview of the Android App Components

LATEST SUBMISSION GRADE

100%

1. Which of the following are ways in which the Layers pattern structures software apps and infrastructure (choose all that apply): **4 / 4 points**

   ☑ Decomposes groups of subtasks into levels of abstraction

   > ✓ **Correct**
   > See M1-L2

   ☑ Partitions an overall system architecture into groups of subtasks

   > ✓ **Correct**
   > See M1-L2

   ☐ Provides services beyond the operating system and protocol stacks to enable components in a distributed system to communicate and manage data

   ☐ Enables end-to-end communication by specifying how data should be (un)packetized, addressed, transmitted, routed, and received

2. Which of the following are reasons that layering is applied in Android (choose all that apply): **4 / 4 points**

   ☑ Enables "plug and play" replacement of certain layer implementations

   > ✓ **Correct**
   > See M1-L2

   ☐ Increases context switching, synchronization, and data copying overhead

   ☑ Reduces the complexity of APIs that app developers must understand

   > ✓ **Correct**
   > See M1-L2

   ☑ Enhances systematic software reuse

   > ✓ **Correct**
   > See M1-L2

3. Which of the following are implications of being "higher" in the memory hierarchy of a modern computing device (choose all that apply): **4 / 4 points**

   ☐ Memory bandwidth is slower

   ☐ CPU access latency is higher

   ☑ CPU access latency is lower

   > ✓ **Correct**
   > See M1-L3 - pt.1

   ☑ Cost is greater

   > ✓ **Correct**
   > See M1-L3 - pt.1

4. Which of the following are correct statements of Android linux RAM (choose all that apply): **4 / 4 points**

   ☑ All Android apps execute in user space RAM

   > ✓ **Correct**
   > See M1-L3 - pt.1

   ☐ User space is a less restrictive protection domain than kernel space

   ☐ Apps running in user space can never access RAM of other apps

☑ Android Linux executes in kernel space RAM

✓ **Correct**
See M1-L3 - pt.1

5. Which of the following are true statements about Android's local and remote inter-process communication (IPC) mechanisms (choose all that apply): `4 / 4 points`

☑ TCP/IP is used to access the Internet

✓ **Correct**
See M1-L3 - pt.2

☑ These IPC mechanisms reside within the kernel's device driver framework

✓ **Correct**
See M1-L3 - pt.2

☐ UNIX domain sockets are used to communicate with remote UNIX servers

☐ The Binder driver supports highly optimized LAN and WAN communication

6. Which of the following are true statements about processes in Linux (choose all that apply): `4 / 4 points`

☐ A process provides units of execution for instruction streams that run on processor cores

☑ A process contains one thread by default

✓ **Correct**
See M1-L3 - pt.2

☐ Processes appear at multiple layers in the Android software stack

☑ A process provides a unit of resource allocation and protection

✓ **Correct**
See M1-L3 - pt.2

7. Which of the following are true statements about the Android Hardware Abstraction Layer (HAL) (choose all that apply): `6 / 6 points`

☑ It shields higher layers of Android's software stack from Linux kernel idiosyncracies

✓ **Correct**
See M1-L4 - pt.1

☐ It is implemented in kernel space to optimize performance and is written largely in C

☑ It is implemented in user space and is written largely in C/C++

✓ **Correct**
See M1-L4 - pt.1

☑ Android apps rarely access the HAL directly

✓ **Correct**
See M1-L4 - pt.1

☐ It's open source license ensures that all HAL driver implementations are available in open-source form

☐ It is implemented in user space and is written largely in Java

8. Which of the following are true statements about the "Android Runtime" (ART) execution environment that are not true for the Dalvik VM execution environment (choose all that apply): `4 / 4 points`

☑ It provides an "Ahead-of-Time" (AOT) compiler

✓ **Correct**
See M1-L4 - pt.2

☐ It provides a Just-in-Time (JiT) compiler

☑ It provides a better garbage collector

✓ **Correct**
See M1-L4 - pt.2

☐ It executes standard Java Bytecode

9. Which of the following are examples of app components available in Android core libraries (choose all that apply): **6 / 6 points**

☐ Stamped Locks

☑ Service

> ✔ **Correct**
> See M1-L4 - pt.3

☐ Threads

☑ Content Provider

> ✔ **Correct**
> See M1-L4 - pt.3

☐ Phasers

☑ Activity

> ✔ **Correct**
> See M1-L4 - pt.3

10. Which of the following are benefits of the Android Native Development Kit (NDK) (choose all that apply): **4 / 4 points**

☐ It provides a managed runtime environment for executing Java garbage collection efficiently

☐ It can help improve portability across heterogeneous Java platforms

☑ It can help integrate existing C/C++ libraries into Android apps

> ✔ **Correct**
> See M1-L4 - pt.3

☑ It can help enhance performance by minimizing latency and maximizing throughput

> ✔ **Correct**
> See M1-L4 - pt.3