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**BSC (Honours) in Computing - Full-time - Year 4**

**Distributed Systems**

# **Repeat Terminal Based Assessment Assignment**

## Smart City Grpc Application

## ProjectReport

* Introduction

* Service Definitions - Use of gRPC (**12%**) o For each of the 3 different services a corresponding proto file is defined and used o All 3 different types of RPC invocation styles have been used (simple RPC, server-side streaming RPC, client-side streaming RPC, bidirectional streaming RPC)
  + Appropriate and different message structures and field types are used

* Service Implementation - 3 sufficiently complex services are implemented (**26%**) o One service must be written in a language other than Java. [8%] o The other two services should be written in Java. [2 \* 6 = 12%] o Service complexity and implementation [3 \* 2 = 6%]

* Naming Services - Use of jmDNS (**12**%) o Marks for service registration and discovery [3 \* 4 = 12%]

* Remote Error Handling (**5%**) o appropriate error handling for remote invocations and error messaging o user input validation

* Client - Graphical User Interface (GUI) (**6%**) o That allows to view (e.g., present, discover), control (parameters) and invoke the services/devices
  + The GUI can be developed in any language, technology of choice (Java application, web based, etc)

## Section B – Related Questions (24%)

From this section, please implement or answer **any 2 of the following questions**

**Q1:** Explain the MQTT broker architecture with an example.

**[12 marks]**

**Q2:** Explain and illustrate the sequence of events during a remote procedure call?

**[12 marks]**

**Q3:** How to choose between CP (consistency) and AP (availability)? Discuss the criteria/ requirements for different types of applications.

**[12 marks]**