

# TCN 5271 Advanced IoT Communications and Networking Exam Take-Home – Summer 2022

**Score:** Score out of 200 points

**NAME:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

## **Instructions:**

- Do not underline unless it is needed.
- For legends, do not use color legends. Your exam should be understandable printed in B&W.
- Make sure you create your work on your own. Use your own words. Do not copy and paste from the internet or book(s). However, you can use resources if needed and make sure you cite them. **However, if you copy verbatim, you need to mention and add quotes. It does not mean that you can quote long paragraphs. You also need to cite if you paraphrase from a book, publication, or any other source. If your answer is a complete cite, you may not get full credit or no credit at all. USE YOUR OWN WORDS and UNDERSTANDING.**
- Do not share questions or answers with anyone. Doing so, may carry penalties including deduction of grade, an F for the exam, and F for the class, or even be reported. It is not worth it.
- Interpreting the question in your manner does not provide a cover for your answer. You can send me an email at [gchaparr@fiu.edu](mailto:gchaparr@fiu.edu) and provide ample time for me to reply. When emailing, you must be specific, including your name, the class, and what your question is. However, please do not ask me how to do something or for the answer. You are taking a test, the same as if you were in the class.
- It is your responsibility to understand the question and provide the correct answer.
- As you know, following instructions, providing organized, detailed information, and answering clearly will give you the best shot for the best grade.
- Upload a PDF to the CANVAS system – Failing to do so (or uploading a different file) will be penalized.
- Return file as PDF (when submitting online).
- Add a footer to each page to have your last name and the first letter of your first name. (Example: Chaparro, G.)

1. [20 points] Explain the concept of M2M and IoT and explain what their differences are.
2. [20 points] Explain at least three different modulation mechanisms used in the physical layers of IoT protocols.
3. [20 points] Explain the concept of Wireless Sensor Network and its difference with an IoT network.
4. [20 points] Explain the physical and link layers of the following protocol: IEEE 802.3.
5. [20 points] Explain the physical and link layers of the following protocol: IEEE 802.11.
6. [20 points] Explain the physical and link layers of the following protocol: IEEE 802.15.4.
7. [20 points] Explain the physical and link layers of the following protocol: BLE 4.0+.
8. [30 points] Watch the following lecture and provide a summary of it. " How does 5G fit into the future of IoT? - Webinar" ( <https://www.youtube.com/watch?v=TilgPBzPasg>)
9. [30 points] Watch the following lecture and provide a summary of it. "Webinar: Lightweight & Scalable IoT Messaging with MQTT" (<https://www.youtube.com/watch?v=TyRxxx6lBqw> )