

# UG Exam Performance Feedback

## Third Year

### 2018/2019 Semester 2

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COMP32412 The Internet of Things: Architectures and Applications

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**Comments** The exam consisted of three questions. Over 99% of the students attempted all three questions.

The performance between the first two questions differed with the performance for the first question (Q1) being better than the second question (Q2). Part (a) of Q1 was answered well from about 2/3 of the students providing in general appropriate information models for the related VEs. However, there was often confusion as to what metadata really is. Some students omitted completely the metadata blocks without any justifications and marks were lost for that. For those cases where the students justified properly the lack of metadata blocks no marks were taken off. Part (b) was assumed to be an easy one. Almost all students remembered correctly that a VE can represent one PE but when this was applied to the question often this was done in the wrong way. Actually only one of the two drawings has an error. Part b(ii) was answered correctly by the vast majority of the students answered correctly where all characterizations as unidentified, undefined, uncategorized where taken the correct term "unclassified." Part b(iii) was also answered correctly by the majority of students where a choice between websockets and RESTfull technologies was expected. Part (c) was in general well addressed although marks were lost for no diagram, no proper description of the FSK, and really bad quality diagrams which didn't at all illustrated the binary FSK encoding of the given message.

Part (d) was not well addressed from the students. Most answers were about the greater power of the WLAN, which is true but power by itself is not enough. It's also the higher channel BW of WLAN which can interfere with several channels of the Bluetooth network. Answers that indicated Bluetooth as the main interferer didn't receive marks.

Question 2 was also attempted by most students where the majority determined correctly the minimum number of piconets needed. Some though didn't recall the proper number of devices a piconet can support and gave wrong answers. No marks were given in this case. Irrespective of the answer in this part, if the thinking was correct for part a(ii), marks were given accordingly. The maximum number of hops was relatively straightforward to determine. However, for the minimum number of hops, the majority considered the simple cases of two nodes in one piconet. However, the expectation was to consider any two nodes where these can belong in the farthest piconets. Few students considered this and received full marks, while one mark was typically lost for the other answers.

In part a(iii), to my disappointment, a mixture of answers was given that often showed lack of understanding. The model and expression was given in dBm and therefore the safest way to solve this problem was with all terms in dBm, which required some mW to dBm conversion. Often this conversion was incorrect, which was disappointing.

Part b was about the alternative of FDD and was simply bookwork. In several cases, however, there was confusion of multiple access techniques and marks were lost accordingly. Part c, on the other hand, had several ways to be answered as there are several options to extend the range. Some were appropriate but some were rather not realistic and/or practical. Most students got most of the marks and some full marks for this part. For answering correctly, part d(i) three marks were given. We expected the answer to be between BSS and IBSS, whether is proper to have or not have an AP in this case, and whether the chosen solution is appropriate for a small number of devices as is described in the question. Whoever, mentioned all three was given full marks in most cases (unless other incorrect points were listed).

Finally, part d(ii) was partly missed from most of the students. A typical 50% success was recorded for this part as a specific point about ad-hoc networks was missed.

Q3: The question was attempted by almost all students with good success. The first two parts of the question, which required to derive a simple formula and do some calculations with it was successfully answered by a majority of the students. The second part of the question was to find a suitable strategy for reducing the energy demand for heating a home. Most of the students opted for the strategy that was suggested in the coursework (which is perfectly fine), but some of them attempted more sophisticated strategies, which was commendable. The standard of work was very good and the average mark reflected this.

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