

國立成功大學
111學年度碩士班招生考試試題

編 號： 181
系 所： 電腦與通信工程研究所
科 目： 通訊工程英文
日 期： 0219
節 次： 第 1 節
備 註： 不可使用計算機

※ 考生請注意：本試題不可使用計算機。請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. 英翻中 (35%)

**In the following are the comments from Prof. Tom Marzetta, the director of NYU Wireless, on the lingering problems with 5G. [Source: IEEE Spectrum (June 8, 2021). Reporter: Michael Koziol.]
Translate these comments to Chinese.**

英翻中開始處：

One problem is the blockage problem with millimeter waves (毫米波). Foliage (樹葉), glass, the human body can all essentially completely attenuate a millimeter wave signal. If my hand or my body can block the signal, and I'm moving around, sometimes I'm going to block the signal. People aren't going to want to use millimeter wave if that happens. One remedy is a larger number of base stations. And now that itself is a problem because there's a handover problem. If you lose connection with one base station, it takes a while to connect with another one. That's an unacceptable delay.

So your next thought is, let's connect to two or more base stations at once. In one sense, that's a waste of resources. But on the other hand, we're operating at 10 times the cellular frequencies, so there's 10 times as much spectrum available. You can afford to be a little bit profligate (浪費的) with spectrum then. There are then a lot of questions about how many base stations do you have in the area, how many people wanting service, and so on, which is not at all a trivial problem.

There's also the applications. Some of our people are looking at using 5G equipment and protocol for remote control of robots and drones (無人機). When you want to do closed loop control of something, the very worst thing is if there's a delay. When you're applying a control input, you want to have some feedback as to what that's doing to the drone or to the robot. And if there's a delay, disaster can occur.

英翻中結束處。

2. 中翻英 (40%)

(a) 通訊的目的為將訊息以可靠且有效率的方式由 A 地傳送至 B 地。(10%)

(b) 一個基本週期為 T_0 之週期性訊號 $x(t)$ 其連續時間傅立葉級數表示式為

$$x(t) = \sum_{n=-\infty}^{\infty} a_n e^{jn\frac{2\pi}{T_0}t},$$

其中連續時間傅立葉級數係數為

$$a_n = \frac{1}{T_0} \int_{T_0} x(t) e^{-jn\frac{2\pi}{T_0}t} dt. \quad (20\%)$$

(c) DSB-SC 調變方法將信息訊號乘上載波頻率為 f_c 之弦波以產生傳送訊號。(10%)

3. 文法改錯 (25%): 請寫出改正後完整之句子。

(1) All the child was safe.

(2) The job fair will hold on April 10.

(3) The teacher asked her why was she late.

(4) There have many animals in the pet shops.

(5) I am looking forward to see you.