Wireless Communication HW5

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1 Problem 1

1. $$f_c = 250kHz$$

2. 8

3. 3

4. $$f_i = f_c + (2i - 1 - M)f_d = 250 + 25(2i - 1 - 8)kHz$$

   where

   $$1 \leq i \leq M$$

   75, 125, 175, 225, 275, 325, 375, 425kHz

5. 3

6.
$$2f_d = 50kHz$$

7.
$$2 * (M) * f_d = 400kHz$$

8.
$$2 * f_d * L = 3 * 2 * 50 = 150$$

2 Problem 2

QPSK is PSK algorithm that can produce 4 type of signal. OQPSK add time offset in quatrature-phase stream thus can prevent large jump on phase that is helpful on performance over BER.

3 Problem 3

1. Area of 1 cell:
$$1.5R^2\sqrt{3} = 3.74Km^2$$
64 cell:
$$64 * 3.74 = 239.36Km^2$$

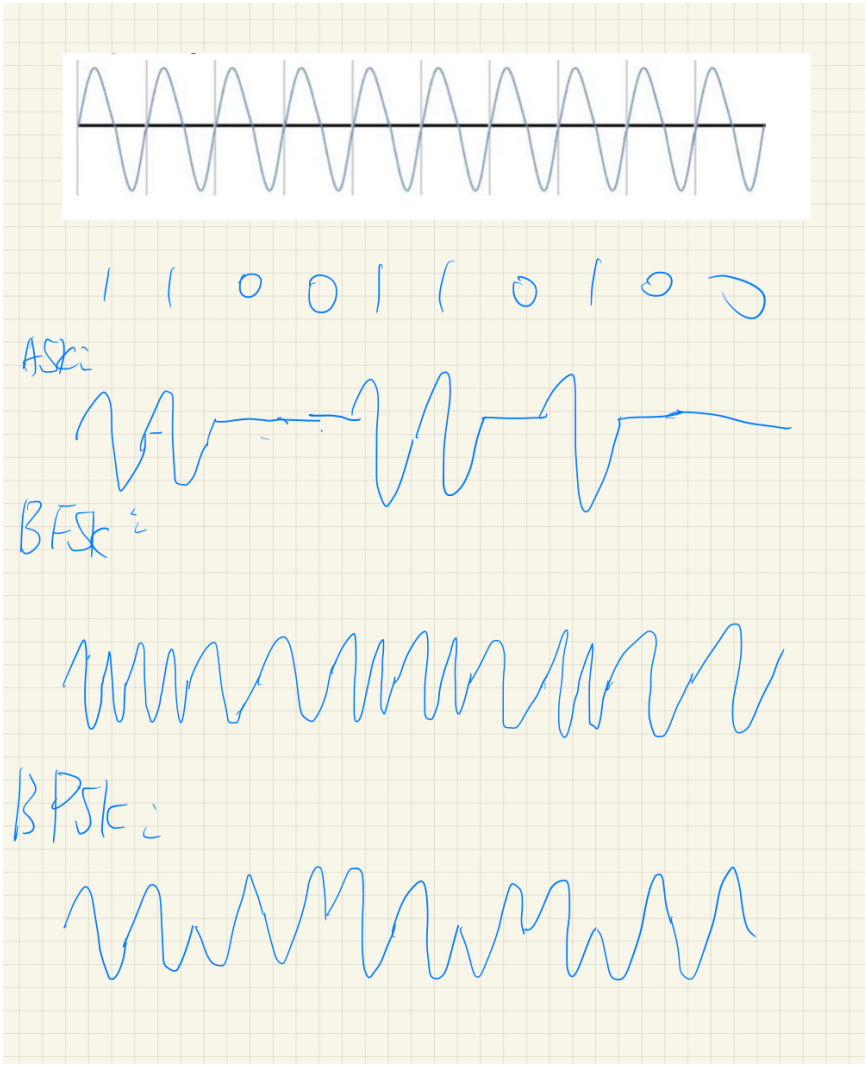
2.
$$343/7 = 49$$

3.
$$49 * 64 = 3136$$

4.
$$D = R\sqrt{3N} = 1.2 * \sqrt{21} = 5.5Km$$

5.
- Add total cell, because the total channel is
$$\text{total\_cell} * \text{total\_channel\_per\_cell}$$
- Decrease reuse factor, because channels per cell is
$$\frac{\text{total\_channel}}{reuse\_factor}$$

4 Problem 4



5 Problem 5

- Not easy to suffer from noise
- Chearper than analog
- Digital information can be saved and retrived easily