Quiz - DFT, QFT

Due Jun 17 at 11:59pm **Points** 10 **Questions** 5
Available until Jun 17 at 11:59pm **Time Limit** None
Allowed Attempts Unlimited

Take the Quiz Again

Attempt History

	Attempt	Time	Score
KEPT	Attempt 4	less than 1 minute	10 out of 10
LATEST	Attempt 4	less than 1 minute	10 out of 10
	Attempt 3	5 minutes	7.33 out of 10
	Attempt 2	1,606 minutes	6 out of 10
	Attempt 1	23 minutes	3.33 out of 10

ⓘ Correct answers are hidden.

Score for this attempt: **10** out of 10
Submitted Jun 11 at 2:10pm
This attempt took less than 1 minute.

Question 1

2 / 2 pts

[D01-01] Use pen and paper to compute DFT of $\begin{pmatrix} 3 \\ 4 \end{pmatrix}$.

- $\begin{pmatrix} \frac{3}{\sqrt{2}} \\ \frac{4}{\sqrt{2}} \end{pmatrix}$
- $\begin{pmatrix} \frac{1}{\sqrt{2}} \\ -\frac{1}{\sqrt{2}} \end{pmatrix}$
- $\begin{pmatrix} \frac{3}{\sqrt{2}} \\ -\frac{4}{\sqrt{2}} \end{pmatrix}$

- $\begin{pmatrix} \frac{7}{\sqrt{2}} \\ -\frac{1}{\sqrt{2}} \end{pmatrix}$

Question 2

2 / 2 pts

[D02-01] What is the QFT of the state $|01\rangle$?

- $\frac{1}{2}\big(|00\rangle + |01\rangle + |10\rangle + |11\rangle\big)$
- $\frac{1}{2}\big(|00\rangle - |01\rangle + |10\rangle - |11\rangle\big)$
- $\frac{1}{2}\big(i|00\rangle - |01\rangle + i|10\rangle - |11\rangle\big)$
- $\frac{1}{2}\big(|00\rangle + i|01\rangle - |10\rangle - i|11\rangle\big)$

Question 3

2 / 2 pts

[D02-04] What happens if we apply the operation CR_2 to the quantum state $\frac{|01\rangle+|11\rangle}{\sqrt{2}}$?

- $\frac{|01\rangle+e^{\frac{\pi i}{2}}|11\rangle}{\sqrt{2}}$
- $\frac{|01\rangle+e^{2\pi}|11\rangle}{\sqrt{2}}$
- $\frac{e^{\frac{\pi i}{2}}|01\rangle+e^{\frac{\pi i}{2}}|11\rangle}{\sqrt{2}}$
- $\frac{e^{\pi i 2^{-1}}}{\sqrt{2}}|11\rangle$

Question 4

2 / 2 pts

[D02-02] Select the gates which are used in the QFT circuit.

- [x] H
- [x] CZPowGate
- [ ] Z
- [ ] X
- [ ] Y
- [x] SWAP

Question 5

2 / 2 pts

[D02-03] How do we create the CR_k operation in Cirq?

- [ ] `crk = CZPowGate(exponent = k)`
- [x] `crk = CZPowGate(exponent = 2/2**(k))`
- [ ] `crk = CRk(exponent = 2/2**(k))`
- [ ] `crk = CR(exponent = k)`

Quiz Score: **10** out of 10