

Total Marks: 20, Time 20 minutes

Instructions:

1. Write answer on white page(s).
2. Make a single pdf named as **7_digit_roll_number.pdf**.
3. Submit to moodle.
4. **Start at 10:05 am and stop at 10:25 am. Submit by 10:35 am.**

Questions:

1. Find the Fourier transform of the signal $g(t) = \Pi\left(\frac{t}{\tau}\right)$. Draw both the time domain and frequency domain representations. **(Marks: 5)**
2. Explain analytically that if $\tau \rightarrow \infty$, the spectrum of Q.1 converges to an impulse function. Also prove this mathematically. Now justify whether Dirichlet condition is a necessary condition for the existence of Fourier transform of a time domain signal. **(Marks: 5+5+5 = 15)**