

1. **Discrete Q1**

Find the seventh term of the sequence where the  $n$ th term is given by  $a_n = \frac{n^2}{2^n}$ .

2. **Discrete Q2**

Find the sum of the following series up to  $n$  terms:

(a)  $5 + 55 + 555 + \dots$

(b)  $0.6 + 0.66 + 0.666 + \dots$

3. **Analog Q**

A charged  $30\mu F$  capacitor is connected to a  $27mH$  inductor. What is the angular frequency of free oscillations of the circuit?

4. **GATE 2023**

Let  $x(t) = 10 \cos(10.5\omega t)$  be passed through an LTI system with impulse response  $h(t) = \pi \left( \frac{\sin(\omega t)}{\pi t} \right)^2 \cos(10\omega t)$ . The output of the system is: