

<b>Name:</b>	 <b>UPES</b> UNIVERSITY OF TOMORROW
<b>Enrolment No:</b>	

**UPES**  
**End Semester Examination, May 2023**  
**Course: Instrumentation and sensor technologies for civil engineering applications Semester: VIII**  
**Program: B.Tech. - Civil Engineering (Spl Infra Dev) Time : 03 hrs.**  
**Course Code: ECEG 3042 Max. Marks: 100**

**SECTION A**  
**(5Qx4M=20Marks)**

S. No.	Question	Marks	CO
Q 1	PT-100 is a Platinum RTD whose resistance at 0°C is 100Ω. If the resistance temperature coefficient of Platinum is $3.91 \times 10^{-3}/^{\circ}\text{C}$ , then find its resistance at 100°C.	4	CO1
Q 2	Explain the principle of photolithography.	4	CO3
Q 3	Mention the applications of capacitive pressure sensor.	4	CO1
Q 4	Explain the principle of capacitive microphone.	4	CO1
Q 5	A pressure sensor has a range of 30 to 125 kPa and the absolute accuracy is $\pm 2$ kPa. What is its percent full-scale and span accuracy?	4	CO1

**SECTION B**  
**(4Qx10M= 40 Marks)**

Q 6	Explain in detail about the LIGA process.	10	CO4
Q 7	Explain with simple sketches the construction of measuring electrode and reference electrode. Why two electrodes are required for pH measurement?	10	CO2
Q 8	Name different techniques used for level measurement of a liquid. Explain the principle of operation of hydrostatic differential pressure level gage.	10	CO2
Q 9	With help of diagram explain how signal conditioning has done in case of resistance temperature detector.	10	CO2

**SECTION-C**  
**(2Qx20M=40 Marks)**

Q 10	State the set of engineering questions for the followings that need to be answered to determine the purpose of the instrumentation: a) Sensor Selection b) Sensor Siting c) Sensor Installations d) Sensor Monitoring	20	CO3
Q 11	Explain in detail about the working principles of Vacuum deposition with diagram.  <b>OR</b> Describe sputtering technique for deposition of thin and thick films on sensing surface	20	CO4