**SRM INSTITUTE OF SCIENCE AND TECHNOLOGY**

**COLLEGE OF ENGINEERING AND TECHNOLOGY**

**NAME OF THE PROGRAM: B.TECH NANO/ MIXED**

**ACADEMIC YEAR: 2021-22(ODD)**

**Subject Code and title:** 18NTO308T/Smart sensor systems

**Year and Semester: V Date of Exam: 25/10/2021 Mode of Exam: Online (GCR) Time: 100 minutes**

**Type of Test: CLA2**

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| **Q. No.** | | **Part A. Answer all questions Questions(10x1=10)** | |
| 1 | | Which of the following is not a light detector   * 1. Photodiode   2. Photoresistor   3. Solar cell   4. Phototransistor | |
| 2 | | Silicon based photodetectors works with in the wavelength region of   * 1. 190 – 1100 nm   2. 400 – 1700 nm   3. 800 – 2600 nm   4. 400 – 14000 nm | |
| 3 | | Collision detector is ----------- type   * 1. quantitative   2. qualitative   3. passive   4. absolute | |
| 4 | | In an LDR resistance decreases with \_\_\_\_\_ light intensity   1. Increasing 2. Decreasing 3. Constant 4. For both increasing and decreasing | |
| 5 | | what is the energy of light travelling in vacuum, if its wavelength is 500nm?   * 1. 2.47eV   2. 2.47J   3. 3eV   4. 3J | |
| 6 | | Which of the following statement is not correct about the longitudinal waves   * 1. The medium contents oscillate in the direction of wave propagation   2. Alternate physical compression and expansion of the medium with certain frequencies   3. A medium is required for the acoustic wave propagation   4. It will propagate in vacuum as light | |
| 7 | | The speed of sound in air at standard temperature and pressure is around   1. 244m/s 2. 344m/s 3. 444m/s 4. 433 m/s | |
| 8 | | Velocity of the sound in a fluid can be identified from   1. Sqrt(Bulk modulus/Density) 2. Sqrt(Density/Bulk Modulus) 3. Sqrt(Youngs modulus/Density) 4. Sqrt(Density/Youngs modulus) | |
| 9 | | What is the velocity of sound in water? (density of water at room temperature= 997.77Kg/m3, bulk modulus of water=2.15GPa)   * 1. 1467.9m/s   2. 1467.9Km/s   3. 1500miles/minutes   4. 1500m/s | |
| 10 | | Sound sensor operating in water is known as -------------.   * 1. microphone   2. pressure sensor   3. transducer   4. hydrophone | |
| **Q. No.** | | **PART B. Answer any four questions (4x4=16 marks)** | |
| 11 | | Write a note on surface acoustic wave sensors with suitable figures. | |
| 12 | | What is Hall effect? Write the expression for Hall voltage and Hall coefficient. | |
| 13 | | Briefly explain the working of a photodiode with suitable diagram. | |
| 14 | | What are the three types of radiation detectors? Briefly explain each. | |
| 15 | | Describe the working of a capacitive touch sensor. | |
| **Q. No.** | | **PART C. Answer all questions (2x12=24 marks)** | |
| 16 | | 1. Define temperature of a body. Explain briefly about the three types of heat transfer mechanisms   **OR**   1. Write a note on chemical sensors. | |
| 17 | | 1. Define microphone and briefly explain the working of the four different types of microphones with suitable figures.   **OR**   1. Write a note on force sensors with suitable figures. | |