VIT®

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

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SCHOOL OF ELECTRONICS ENGINEERING

Continuous Assessment Test– I

ECE3032 – SENSOR TECHNOLOGY

Programme: **B. Tech (BIS, BSW)**
Semester: **Winter 2019-2020**
Max. Marks: **50**

Date: **24/01/2020**
Time: **9:30 to 11:00 AM**

Faculty: **Dr K. Govardhan, Dr R Mangaiyarkarasi**

Answer **ALL** questions

Q1. Elucidate on smartness exhibited by a few special materials. Enlist and brief on various phenomena of smart materials.   [10]

Q2. A new bio-implant needs to be developed to help the deaf people with active cochlear nerve. Describe a micro bio-sensing system to perform this operation.   [10]

Q3. A semiconductor PN junction has to be employed as a photosensor. Brief on the operating constraints to be employed while using the PN junction for this application. Elaborate on the working mechanism with relevance to charge carrier transport involved in this sensing process.   [10]

Q4. Identify a thick film coating technique that uses a centrifugal force to form a film from a lumped viscous material. Illustrate the coating mechanism and brief on the precautions to be followed in optimizing the film thickness.   [10]

Q5. A 20 μm thick film of an aqua gel-based nanomaterial needs to be dip-coated onto a ceramic substrate. The viscosity of the aqua gel is 35 mPa-s and the density is 650 g/m^3. i) Determine the withdrawal speed on the dip-coating process to achieve the 20 μm film thickness. ii) If the film thickness has to be reduced to 5 μm with the same withdrawal speed, determine the viscosity of the material required.   [10]